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John O. Reeve, newly appointed Junior Irrigation Engineer, reported for duty at Pomona, Calif., November 1, and was assigned to assist



Colin A. Taylor in his studies of irrigation of citrus trees and other projects.

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In preparation for the season's water spreading studies Dean C. Muckel installed water-stage recorders on the San Antonio, Cucamonga, and Lower Santa Ana River spreading grounds in southern California. Construction of a 10-foot Parshall flume was started on the lower Cucamonga spreading grounds. This will have a concrete floor with 2-inch timbers for the side walls.

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J. C. Marr reports that so far as it has been possible to do so, arrangements have all been made for snow surveys during the coming winter. R. L. Parshall conferred with representatives of various local, State, and Government organizations relative to their cooperation in this project. He gave attention to the winter sports broadcasting program, and prepared a proposed memorandum for field observers as a guide in uniformity of reporting snow conditions as well as form of message to be wired in each Friday morning to the U. S. Weather Bureau, Denver, as the basis for the broadcast report at noon. Carl Rohwer located one new snow course, interviewed cooperators, prepared plans and estimates of cost of taking observations during 1938, and prepared maps showing location of snow courses. Geo. D. Clyde brought up to date all stream-flow records for Utah streams, and analyzed snow-cover normals.

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In connection with the flood control survey, Harry F. Blaney, assisted by A. A. Young, prepared preliminary reports on the three California areas assigned to the Bureau - Kings River, Kern River, and Ventura River watersheds. Data for these reports, pertaining to ground-water conditions, amounts of precipitation, character, frequency, and intensity of storms, damage to crops from high ground-water conditions, etc., were obtained from the headquarters of the Executive Secretary of the Flood Control Committee in the Forest Service office in San Francisco, and from farm advisors, water masters, irrigation district officials, and others in the areas studied.

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Harry G. Nickle visited about 15 localities in Texas to obtain data and photographs of sewage irrigation, to be included in the bulletin on that subject, now being completed, by Wells A. Hutchins.

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Mr. Hutchins spent about a week in the Washington office in December conferring with the Solicitors office regarding proposed co-operative studies looking to a codification of the irrigation laws of the Western States.

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In connection with the revision of National Resources Committee Report on "Drainage Basin Problems and Programs," A. T. Mitchelson attended subcommittee meetings at Berkeley, San Francisco, Los Angeles, and Reno, at which projects were submitted and text of the report reviewed. Harry F. Blaney also attended the San Francisco meeting and later con-



ferred with Mr. Mitchelson regarding projects to be submitted for southern California at the National Resources Committee meeting in Los Angeles. As chairman of the Sub-Committee for Agriculture Mr. Mitchelson reviewed and submitted projects for the Bureaus of Agricultural Engineering, and Biological Survey, the Forest Service, and Soil Conservation Service, and also participated in revision of the text of the Great Basin description, problems and programs.

R. A. Work prepared a talk on "The Control of Soil Moisture" for delivery to the Oregon State Horticultural Society at Medford, on December 2, 1937.

Colin A. Taylor gave an informal talk on "Efficient and Economical Use of Water" before the Valencia Heights Orange Growers' Association at Covina, Calif.

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As reported by John G. Sutton, the C.C.C. drainage camps of the Central District have in three years completed more than 147 million square yards of clearing, 27 million cubic yards of excavation and 168 miles of tile reconditioning, benefiting an estimated 6 million acres of drained agricultural land. They have cleared approximately 4,500 miles of ditches, and 460 miles of levees, excavated 2,800 miles of ditches, reconstructed or repaired 200 miles of levees and leveled 700 miles of spoil banks.

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At the annual meeting of the National Joint Committee on Fertilizer Application in Chicago on November 29, G. A. Cumings discussed several phases of the fertilizer placement research program. Research on fertilizer placement has gradually increased, he reported, from four experiments in 1930 to 119 experiments with 23 crops in 28 states in 1937. One need, he said, is the development of suitable fertilizer-depositing equipment for the farm trade which meets the requirements definitely indicated by the research work. It is also desirable, he said, to determine which types of machines or devices on the market place the fertilizer in an approved manner.

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E. M. Dieffenbach, with headquarters at Logan, Utah, recently visited southern Idaho, to observe the weed eradication methods used there during the present weed eradication campaign conducted cooperatively by Federal, State, and County agencies. In comparing Idaho and Utah conditions and methods, Mr. Dieffenbach reports that in Idaho the weed infestations are often small enough to justify the use of carbon bisulphide as a soil fumigant, whereas in Utah the infestations are usually too large to permit its use, so clean cultivation and application of chlorates are the common methods there.

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Early in December W. M. Hurst visited the Pee Dee Experiment Station, Florence, S. C., to design and supervise the construction of equipment for the Bureau of Entomology and Plant Quarantine for separating hibernating boll weevils from woods trash.

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R. B. Gray attended the meeting of the A.S.A.E. at Chicago, Nov. 29 to Dec. 2. He also attended sessions of the Farm Equipment Institute



and the National Joint Committee on Fertilizer Application. He talked with representatives of several of the farm machinery manufacturers relative to farm machinery investigations.

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On November 29 John W. Randolph gave a report before the annual meeting of the National Joint Committee on Fertilizer Application at Chicago, dealing with fertilizer placement on cotton in Alabama, and on December 1, before the American Society of Agricultural Engineers he presented a paper prepared by I. F. Reed and himself entitled "Effects of Several Factors on the Reactions of Fourteen-inch Moldboard Plows". On December 2 Mr. Randolph presented a paper before the Farm Equipment Institute entitled "Part Played by Tillage Equipment and Tillage Methods on Yield of Cotton on Red Bay Fine Sandy Loam". These papers were well received and created much interest in the cotton machinery project.

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At the Fall meeting of the American Society of Agricultural Engineers, C. K. Shedd showed a movie dealing with the use of the telescoping wagon tongue in maneuvering wagons in the picking of corn. One man appeared to be able to handle all of the equipment very easily and expeditiously.

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Mechanical corn pickers, Mr. Shedd reports, were highly successful during the 1937 harvesting season as shown by tests on the Corn Production Machinery project at Ames, Iowa. A series of tests the latter part of Oct. in four kinds of corn varying in yield from 86.5 to 101.3 bushels per acre showed field losses of from 1.96 to 4.83 per cent of the yield. This is a lower rate of loss than is usually found with hand picking, whereas hand picking has heretofore shown the smaller loss.

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W. R. Humphries returned December 18 from Stoneville, Miss., where investigations of mechanical cotton pickers were conducted in cooperation with the Bureau of Agricultural Economics and the Delta Experiment Station. Three spindle-type machines and one brush-picker pneumatic-conveyor type machine were observed during the 1937 season. Observations were made on the field performance of the machines and laboratory analyses of the quality of the cotton ginned from the machine-picked lots. A report of the season's work will be completed as soon as the laboratory data are available.

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E. D. Gordon reports that more than 1,000 core samples were taken from the Prattville Field (Ala.) this fall after the cotton harvest to be used in making observations on the soil density of the various plots. To measure the soil density by stratifications the soil cores were divided into 2-inch samples. It was observed that not only is there a wide range of soil densities but that there is a close relationship between soil density and the type of tillage operations and a definite inverse relationship between soil density and yield. In what may be termed the root zone the apparent specific gravity readings showed a definite correlation to yield. Below the depth of tillage operations there exists no correlation between density and yield. In a lateral direction from the row there appeared to be definite limits of correlation between yield and density. At 6 inches from the row the density down to level of tillage



operations proved to be definitely related to yield. At 12-inches from the row the correlation was sharply broken off, in the shallow (4-inch) tilled plots. In the deeply (8-inch) tilled plots at 12-inches the correlation factor is on par with the factor found near the cotton row. In all plots at the row middle there was a sharp decline in the relationship of yield to soil density.

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A conference was held on the wheat storage work of the Division of Structures at Chicago on November 29 just previous to the American Society of Agricultural Engineers meeting. This was attended by Mr. McCrory and Messrs. Ashby, Stahl, Swanson and Cleaver of this Bureau and Professors Fenton of Kansas, Foster of Illinois, and Carpenter of Maryland, and W. B. Combs and F. G. Smith of the Bureau of Agricultural Economics. The results of experimental work at the field stations were reviewed and plans made concerning future work.

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After the American Society of Agricultural Engineers meeting Mr. Ashby visited the corn storage project at Urbana, Ill. and conferred with Professors E. W. Lehmann, and W. A. Foster regarding the progress of the work. Mr. Ashby and Mr. Cleaver then proceeded to Ames, Iowa and conferred with Professors J. B. Davidson and H. J. Barre of the Agricultural College, concerning the work at that station and problems of common interest in the corn storage study.

After leaving Ames Mr. Ashby met A. D. Edgar at Grand Rapids, Mich. and after inspection of part of the potato storage work being conducted in Michigan they attended a conference on potato storage at East Lansing, Mich. with Professors H.H. Musselman, C. H. Jefferson, O. E. Robey and E. J. Wheeler of Michigan State College.

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Enroute to Washington Mr. Ashby visited the Nela Park laboratory of the General Electric Co. at Cleveland and discussed studies of farm building lighting with Messrs Porter and Ditchman of that company.

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W. V. Hukill attended the trial demonstration school at the Westinghouse factory in Mansfield, Ohio, Dec. 13, 14, and 15. Representatives from the extension services of several adjacent states also attended. Various types of household equipment and their use were demonstrated with special attention given to use on the farm. Several trips were made to the assembly lines in the factory.

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#### CHIEF TO GET JOHN DEERE MEDAL

The first award of the John Deere Gold Medal, to be given annually hereafter by the American Society of Agricultural Engineers for "distinguished achievement in the application of science and art to the soil", will go to Mr. McCrory, Chief of this bureau. On December 9 Mr. R.W. Trullinger, chairman of the Society's jury on awards, conveyed the notification of the honor, which, he said "is recognition of the high value to agriculture and to society of the 30 years Mr. McCrory has devoted to



research and research administration in the U. S. Department of Agriculture". The formal presentation of the medal will be made during the annual meeting of the Society next June.

The John Deere Gold Medal is a memorial to the man who hammered a piece of saw blade into the first all-steel moldboard, providing a plow that solved a stubborn tillage problem at a time when the Middle West was just beginning its farming development. The awards go to "present-day pioneers who press forward in the furrow he struck a century ago". It is expected to encourage "all forms of advance in the fundamental thing in agricultural progress -- original research in the soil realm -- not from the viewpoint of other sciences, but evaluated in terms of engineering approach".

Among the accomplishments which were the basis for Mr. McCrory's selection as first recipient of the medal, are the following:

Development of methods of surveying and design particularly suited to timbered swamp lands and their drainage.

His emphasis on fundamental research in drainage investigations.

Work on the flow of water in open channels, applying particularly to large and small drainage ditches, which produced results still considered standard for designing open channels.

Establishment of the first soil erosion experiment station (at Guthrie, Okla.) under the division of Agricultural Engineering in 1929.

Progress in the development of snow surveys in western watersheds as a means of predicting water supplies for irrigation and other purposes.

Service as a member of a State engineering board which revised the drainage and flood protection plans for the Florida Everglades.

Establishment of a laboratory for the fundamental study of tillage machinery under field conditions.

Inauguration of agricultural engineering extension activities in the Department of Agriculture.

Service in coordinating the Department of Agriculture activities in agricultural engineering as they relate to soil science with those of the State agricultural colleges and experiment stations and other agencies.

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ANNUAL REPORT IS OUT\*

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A Department press statement on the Bureau's annual report, just off the press, says in part:

A reminder of the broad changes that engineering developments in farming have made in the way of life of the American people prefaces the annual report of S. H. McCrory, Chief of the Bureau of Agricultural Engineering, to Secretary Wallace.

"A century has passed since the invention of the steel plow and the grain harvester", he says. "Today there are more than 1,250,000 farm tractors in use, electric power is available on 1,000,000 farms, 85,000,000 acres of the best agricultural land are in organized drainage districts, 19,000,000 acres are under irrigation in the West, and supplemental irrigation is now practiced on nearly 1,000,000 acres in the humid part of the country east of the one-hundredth meridian".

"There is now a strong tendency for engineering improvements to favor the family-size farm," says Mr. McCrory. He cites the fact that there has been no very noticeable tendency, except in the exclusive wheat regions, for farms to become larger. Among recent developments are the handy general-purpose tractors, many now on pneumatic tires, and the "baby" combine grain harvesters adapted to small fields. In spite of the increase in the number of machines, the report says, the quantity of metal used in farm implements is about the same as in 1917, showing that farmers are getting more out of it than they did 20 years ago.

Although recently farmers have been heavier buyers of new implements and have been renewing their interest in land drainage, the report says large numbers of farms are poorly organized and badly equipped, and deplores the neglect of farmhouses and other farm buildings "to such a degree that new construction and repairs do not at present make up for normal depreciation". Part of this neglect of basic equipment, it says, may be traceable to the tendency to give first attention to income-producing equipment or too much interest in the possibility of buying more land when income is on the upgrade.

\* Copies of the annual report are being mailed to all bureau field stations.

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